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AUTHOR	Leinhardt, Gaea
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ABSTRACT

The purpose of this paper is to present an inservice training program designed to give teachers three groups of selected skills which are useful in an individualized setting: a) recognition and reinforcement of children's self-management skills, b) identification and reinforcement of children's task performance skills, and c) teacher time-apportionment skills. The paper begins with an analysis of some necessary children's skills for the Primary Education Project (PEP) and Individually Prescribed Instruction (IPI) models of individualizations. This analysis serves as the basis for specifying the objectives of the teacher training program, which is described in terms of both content and mode of instruction. Finally, a description and preliminary evaluation of the program are presented. (Author/HMD)

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A TRAINING PROGRAM FOR SELECTED TEACHER FUNCTIONS

Gaea Leinhardt

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Learning Research and Development Center
University of Pittsburgh

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Introduction

The individualization of education in the elementary school involves substantial alteration of the subject matter curriculums and the roles of students and teachers. While Individually Prescribed Instruction (IPI) and the Primary Education Project (PEP)[1] represent curricular revision, the consequences of the role revisions for teachers and students has not been adequately discussed (Lindvall & Bolvin, 1967; Wang, Resnick, & Schuetz, 1970). Specifically, the children must learn to perform many managerial and intellectual tasks which in a nonindividualized setting are performed by the teacher. The teacher on the other hand must learn to teach the children to effectively manage the individualization of their education. One mechanism for teaching teachers to do this is in-service training or workshops.

This paper describes a training program which was designed to teach teachers a core of selected skills that are useful in an individualized setting. It should be stressed that this program was designed as an in-service training program for specific behaviors; this does not imply

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[1] PEP and IPI are programs developed at the Learning Research and Development Center engaged in the development and testing of individualized educational programs for elementary children. The developmental work is carried out in two elementary schools, one urban and the other suburban. The work is focused on curriculum development, classroom management, and teacher training.

that the mastery of these skills represents the sufficient education of an elementary school teacher. Rather, what is implied is that the mastery of certain specific skills will help a new or experienced teacher to more effectively teach in an individualized setting of the type encountered in PEP or IPI classrooms.

Outline of the Paper

The paper begins with an analysis of some of the skills children need to work within the PEP-IPI models of individualization. This analysis provides the basis for specifying the objectives of a program to train teachers in techniques of developing these behaviors in children. The training program is then presented from the aspects of both content and mode of instruction. Finally, a description and preliminary evaluation of the program is presented (Reynolds & Leinhardt, 1970).

The analysis of child and teacher behaviors presented here is limited to the period of time in the PEP-IPI classroom during which children work on assigned tasks which require the use of manipulative materials. During this time, each child completes assigned tasks from a list of academic tasks which (s)he is expected to complete. Manipulative materials for tasks are stored in coded cardboard boxes on open shelves. Each box is marked with a code (indicating the level and objective being taught) which matches the codes used on the prescription tickets.

Analysis of Child's Skills

To function successfully in an individualized setting, a child must show competence in both management and cognitive skills. Before the child can actually perform any of the tasks on the list, (s)he is faced with the problem of locating the box in which manipulative materials for

the task are stored and taking it to a work space. The skills involved in this set of behaviors are designated as self-management skills. Next (s)he must open the box, array its contents, determine what (s)he is to do with the materials, and begin working. These skills are called self-instructional skills and are related to task performance. The specific cognitive skills needed to perform a given task are called academic skills.

At first glance, these skills may appear trivial. Consider, however, what might occur in a traditional classroom: the entire class of 25 to 30 children would be seated and quiet before the teacher either passed out the tasks, called upon a model child to pass out tasks, or called on rows of children to go to shelves to get their materials and return. This would be followed by both a verbal model and demonstration of the simple academic task to be accomplished by all of the children. (In this case, a page of arithmetic problems can be considered a task.) Thus, few if any of the basic managerial or cognitive behaviors required would be initiated by the individual child.

Self-Management Skills. Table 1 lists 21 self-management skills a child uses in preparation for the performance of an academic task. The list of skills was obtained by writing, in order, the procedures involved in locating, selecting, and transporting materials for an assigned task to work areas. This list was confirmed by observing the behaviors of children who function easily in PEP-IPI classrooms, using them as models in this respect. In addition, children who fail to function easily were observed to see which skills seem to be most crucial for success. Each skill in Table 1 can be further differentiated in terms of the sophistication of its performance. For example, skill number 5, "systematically looks for the correct box," is the most sophisticated

TABLE 1

Self-Management Skills

1. Identifies and takes prescription ticket from group or stack of tickets, or sheets.
2. Selects one assignment from the assignment list.
3. Selects appropriate shelf by color code and letter.
4. Goes to the correct shelf.
5. Systematically looks for the correct box.
6. If box (task) is present, takes it.
7. If box (task) is not present, either goes on to the next assignment on assignment sheet or requests help.
8. Takes correct box to desk or floor.
9. Checks task to see if additional material, such as paste, is needed.

* Numbers 8 and 9 may be done in either order.

10. Takes objects out of the box and arranges them face up.
11. Attempts to figure out what (s)he is to do with the materials.
12. If familiar, begins the activity.
13. If unfamiliar, and if necessary, requests teacher attention appropriately.
14. Asks teacher question about what (s)he is to do.
15. Works through task and completes it.
16. Requests teacher appropriately.
17. Indicates to teacher which assignment should be checked off the prescription sheet.
18. Returns objects to box or container.
19. Places any written work in folder or desk.
20. Returns box to correct place on shelf.
21. Selects next assignment to be done.

way of searching for a box and involves matching a sequence of alphabetic and numeric codes on the prescription ticket (e.g., M6A1) to those of a box on a shelf in a systematic way (i.e., finding the right letter shelf, then the first number, the second, etc.). A less experienced child might employ a less sophisticated trial and error search procedure. The child gains in sophistication when (s)he learns that only certain letters appear on certain shelves, and that the numbers on the shelves are ordered. The 21 self-management skills do not constitute a linear sequence of behaviors carried out in the performance of any one task. Rather, they are a set of behaviors, subsets of which form sequences that lead a child from the assignment sheet or prescription ticket through the performance of one task and to the initiation of another.

Task Performance Skills. Once the child has obtained the appropriate materials and knows what (s)he is to do with them, (s)he must call upon a second category of skills as (s)he engages in the performance of the academic task. The second category of skills consists of those in which the child engages as (s)he performs the task and involves both (1) self-instructional skills, or generalizable "attack" skills, and (2) academic skills, or specific subject matter skills. For any academic task we distinguish four stages as shown in Figure 1: (1) Set up, (2) Model, (3) Extension, and (4) Completion.

There are two major reasons for breaking the tasks down into stages. First, it permits the teacher to limit the communications to a child to those which, at a specific point in time, are most relevant in terms of successful task completion. Second, it provides a common structure which the child can learn and apply to new tasks.

Each stage will be defined in terms of the way in which each one appears upon completion. The set up stage is completed when all

Stage	Self-Instructional and (Academic) Skills
Set up: all materials in the task are laid out	Gathering (specific) materials needed for a task
Model: the first element of a task is completed	The (specific) content of the task identified through completion of first element
Extension: continual repetition of first element or further development of the task based on initial element	Further development of the (specific) task
Completion: task finished accurately	(Specific) task completed accurately

Figure 1. Stages of Task and Associated Skills.

materials required for a task are gathered and laid out so that all components are visible to the child. The model stage is completed when the first "element" of a task has been completed. In a color sorting task, for example, the complete sorting of one color is the model for sorting the other colors. In a puzzle, the first piece placed correctly is a model in fitting other pieces into the puzzle. The term "model" is used to indicate that some self-contained portion of the task, which can be repeated, has been accomplished. Some tasks may have more than one portion, each of which has a model. The third stage, extension, is the main body of the task. It may be simple repetition of each element, as in a sorting task, or a more complex arrangement of the elements based on the initial definitions in the model(s) of the task. The final stage, completion, is finishing the task accurately.

Some examples of possible behaviors of teachers who are not sensitive to the stages by which a task is performed follow. First, a child looking at a task in a box says, "I can't do it," whereupon the teacher removes all the material from the box in one motion--usually while giving a complex verbal description of what the child should do--and starts to do the task giving what (s)he considers a prompt for the child to continue. In fact, the child lost the flow of the explanation at the first distracting motion of gathering all of the materials out of the box. Another example is that of a teacher standing over a child waiting until (s)he "catches up" to the place where tutorial information is expected to be needed, rather than making use of the time when the child is occupied to help another child. In a tutorial setting waiting for a single child until (s)he needs help may not be wasteful, but it is in an individualized setting in which all children need support.

Objectives for Teacher Training Program

The method of teaching discussed here is based largely upon a reinforcement model. The teacher is taught to reinforce those behaviors of the child which tend to increase and support learning. It is assumed here that any teacher attention acts as a reinforcer, but that the most effective reinforcers are those which verbally identify, for the child, the specific behavior being reinforced. According to theory (Skinner, 1954), reinforcement alone should increase the behavior. The problem with human subjects in a natural setting is that at any point in time an entire spectrum of behaviors is being exhibited, and it is not easy for the child to isolate those which are being reinforced. Further, unlike the animal laboratory setting, the reinforcer rarely follows the behavior immediately (within one second) (Bandura, 1969). Three groups of skills which the teacher needs to teach or to perform will be discussed: self-management skills, task performance skills, and traveling (brief contacts with pupils at work).

Identifying and Reinforcing Self-Management Skills. The teacher must be able to identify and reinforce all of the self-management skills which a child needs. Teachers without training in reinforcement often deal with the lack of self-management behavior by the use of negative or sarcastic comments or commands, e.g., "sit down," "don't call out, raise your hand." The teacher must learn to recognize instances in which self-management skills are exhibited and then develop specific reinforcing statements which identify the relevant behavior for the child. These reinforcers tend to maintain appropriate self-management skills (Harris, Wolf, & Bear, 1968). Clearly, the teacher is not expected to reinforce every instance of self-management skills, but after training (s)he is in a better position to choose when and what to reinforce.

Identifying and Reinforcing Task Performance Skills. Within the framework we have presented, the teacher teaches the child the various stages of a task by reinforcing him or her when (s)he has accomplished a part of the task, and by verbally identifying the task and the curriculum objective. In addition to the common structure of most tasks, for each stage of any specific task there are unique substantive behaviors which can be reinforced or prompted. Figure 2 shows possible teacher behavior found in each stage of a model problem.

An Example of a Classification Task. In the set up stage (see Figure 2), the teacher verbally identifies which specific material the child has out, as well as the fact that (s)he is ready to start. This reinforces the child for beginning and labels the equipment with which (s)he will be working. In the model stage, the teacher either (1) reinforces the child by describing what has been done specifically (academic skill) and stating that (s)he is on the right track for the entire task (self-instructional skill) or, (2) if the child does not know how to do the task, but has completed the set up, the teacher can model the task. In the extension stage, the teacher reinforces the child for working, that is, for persevering (self-instruction), evaluates the work, and if appropriate, questions the child and identifies the objectives of that specific task (for example, sorting colors). In the completion stage, the teacher evaluates the rest of the work, perhaps again questioning the child, identifies the more long-range curricular objective (for example, learning the names of colors), reinforces the completion of the task correctly, and checks the task off the prescription ticket. It is not intended that a single child will be reinforced at every stage for every task. What is intended is to show natural division points within most tasks which provide a teacher with an opportunity to reinforce a child.

Stage	Reinforcement of Self-Instructional Skills	Reinforcement of Academic Skills
Set up: Matrix board out, all pieces face up	"Good, you have everything out."	"You have the matrix board and the colored shapes laid out."
Model: Row or column filled correctly or two pieces from different rows and columns in place	"You've begun perfectly. The rest is done just like that."	"You have all of the squares sorted by color. If you do the other shapes the same way, you will fill up the matrix."
Extension: Several rows or columns filled	"You've been working well on that."	"(Wow!) All the blues, greens, and purples are sorted by shape." Sets task objective: "You are going to fill in the entire matrix by color and shape."
Completion: Entire matrix finished	"It's all done."	"You sorted all the objectives by color and shape and found where they belong on the matrix!"
		Curriculum statement: "You're learning to classify by color and shape; soon you will be able to do color, shape and size."

Figure 2. Stages of Classification Task with Possible Teacher Behaviors

Traveling. The third group of skills which a teacher needs arises not from individual child behaviors, but from the fact that there are 25 or more children in each room. In an individualized model, not only are children engaged in numerous activities, but each child is perceived as needing reinforcement for unique elements of their own unique behaviors. If a teacher is to teach by selecting different children for different reasons, (s)he must distribute his or her attention in a way which reaches each individual as frequently as possible and at appropriate times. A crucial task for the teacher, then, is making quick decisions concerning which children to attend to and which to ignore.

Operations and Decisions for the Traveling Teacher. A hypothetical series of decisions and operations which a traveling teacher might make are described in a flowchart (Figure 3). Operations are indicated by rectangles and decisions by diamonds. Operation 0-1 on the flowchart is the selection of a child. This operation could be further analyzed, yielding several components: how close is the child; is the hand raised; did I promise to return quickly; does this child or another need more attention and more support from me; etc.? The next step (D-1) is to decide whether the child at this moment is engaged in an appropriate behavior. Is (s)he exhibiting one or more of the behaviors defined as self-management or academic skills? If not, the decision would be to select another child.

Children who are not working are ignored for two reasons. First, it is assumed that a nonreinforced activity will extinguish (provided, of course, that the activity is not self-reinforcing). Second, because the teacher operates under time constraints, there is a continuous effort to get him or her to attend to those children who are working (in the broadest sense) rather than to spend time prodding and disciplining

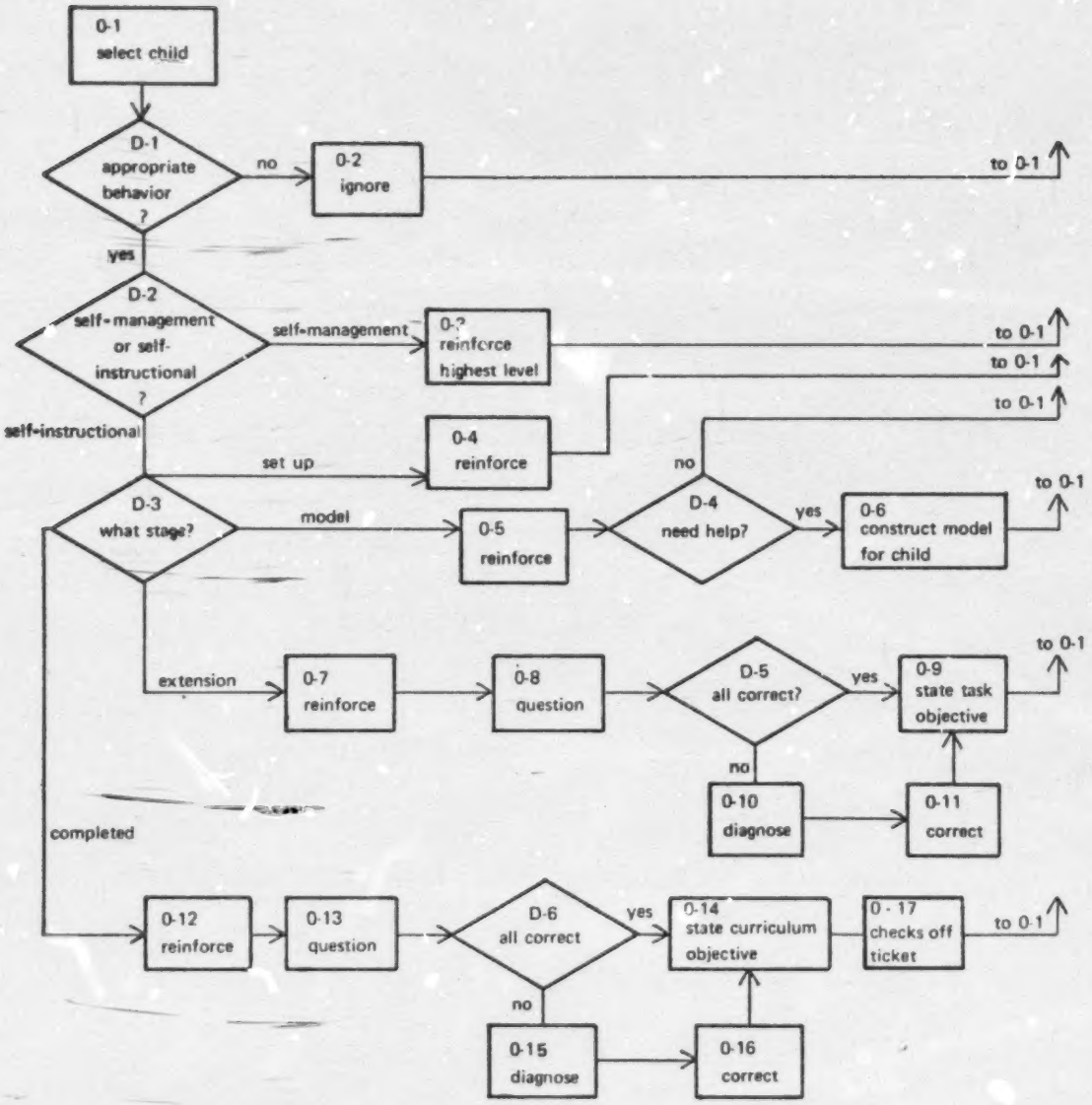

Figure 3. Operations and Decisions for the Traveling Teacher

nonworkers. When this procedure is followed, we can expect to see an increase in work behavior and a decrease in discipline problems (Hall, Lund, & Jackson, 1968).

Continuing with the flowchart--is the child exhibiting a self-management skill or a self-instructional skill (D-2)? If it is self-management, (s)he is reinforced at the highest level exhibited (0-3). The teacher then selects another child (0-1). If it is self-instructional, another decision (D-3) must be made as to what stage of the task is being performed. As the teacher approaches the child, (s)he praises the child for working and upon closer examination identifies the stage. If the child is setting up the material, (s)he has responded for the moment (0-4) and can select another child. If the child has completed the set up and begun the task, the teacher reinforces the child (0-5) and checks to see if the model for the task is correct. If the child requests help (D-4) or if the task is incorrect, the teacher models the task for the child (0-6) and selects another child. When the child has completed more than the first component of the task, the teacher reinforces him or her for working (0-7), evaluates or questions the child on completed portions (0-8), and checks if everything is correct (D-5). If correct, (s)he states the specific task objective (0-9), e.g., "to put the cubes in order from largest to smallest." If all of the task is not done correctly, the teacher attempts to analyze briefly any mistakes (0-10), then corrects them or shows the child how to correct them (0-11), states the task objective (0-9), and moves on. When the child completed the task, the teacher engaged in a similar set of behaviors with two differences: (s)he stated the curricular objective for the child (0-14), and (s)he checked the child off on the prescription ticket for completing the task (0-17).

The preceding description may sound as if the teacher must spend a long time with each child but, in fact, the entire operation goes

quite quickly and the teacher is able to attend to three to five children in one minute. Further, this set of behaviors is not considered an "ideal" but rather a skeleton core around which the more subtle and sophisticated teaching behaviors can be built. That is to say, the teacher is probably using several such flowcharts concurrently. Because individualization puts great burdens on the teacher, however, a careful analysis of some of the teaching behaviors can be useful.

The specific criterion for contacting a child, or the nature of the reinforcement that is given to any particular child, can and should vary greatly. It is hoped that by providing one set of skills through training, a teacher will be in a better position to construct unique criteria than if there were no training and if no alternatives were offered.

Description of the Training Program

Based on the analysis of the skills required for teaching in an individualized setting, a training program was designed. The program uses two basic approaches to training. The first approach is reflected in units 1-4 and 8-12 (Figures 4 and 5) which are constructed to produce low error rates during training sequences, have a high mastery requirement for continuing, and unique "correct" responses. The second approach is reflected in the other six units which were designed to be discussion units without unique "correct" responses. At the end of each section, the teacher is video taped and reviews the performance. The first section, units 1-7, teaches identification and reinforcement of nine of the more important self-management skills. The second section, units 8-15, teaches identification and reinforcement of self-instructional and academic skills.

The sequence of steps in section 1 is shown in Figure 4. The trainee is taught to reinforce the self-management skills by first

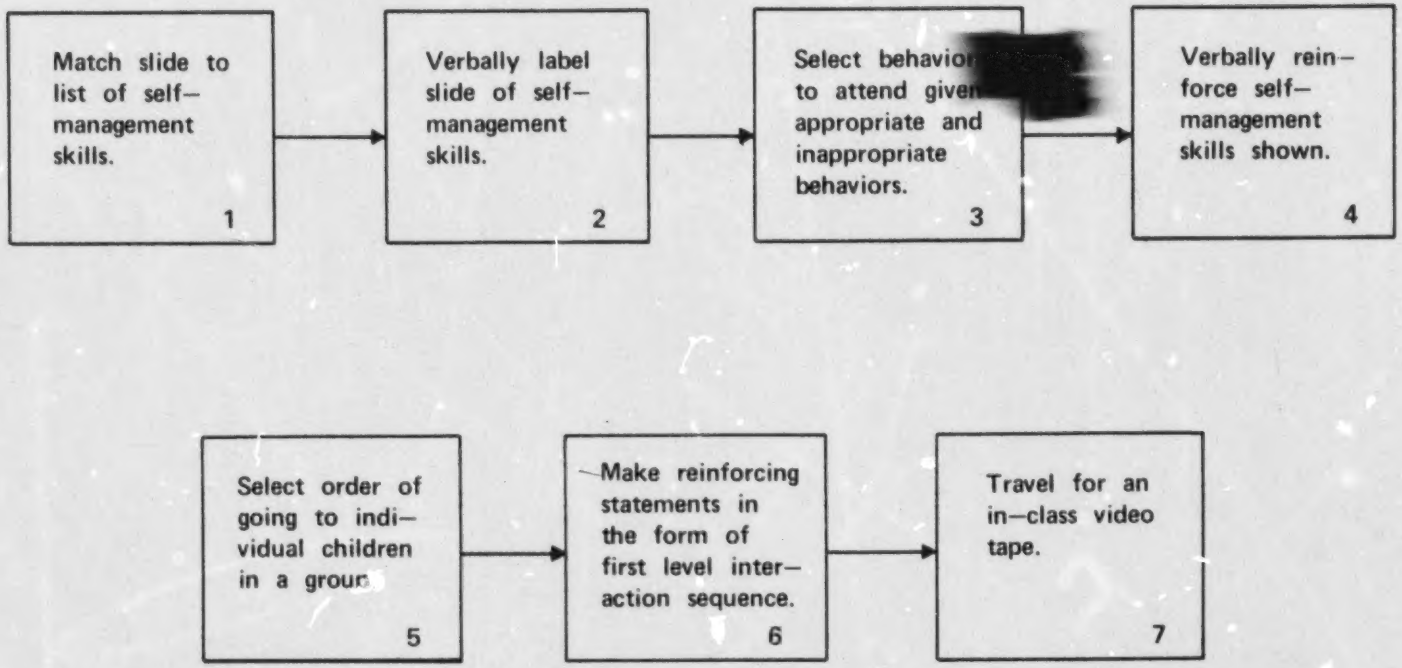
Match slide to list of self–management skills.
1
Verbally label slide of self–management skills.
2
Select behavior to attend given appropriate and inappropriate behaviors.
3
Verbally reinforce self–management skills shown.
4
Select order of going to individual children in a group
5
Make reinforcing statements in the form of first level interaction sequence.
6
Travel for an in–class video tape.
7

Figure 4. Sequence of Training Program: Section 1

matching 26 slides of children performing various self-management skills to a written checklist identifying those skills (1). When the trainee can match the slides with 90 percent accuracy, (s)he is shown 26 similar slides and asked to name the self-management skills shown (2). When the trainee can label the slides accurately, (s)he is shown a set of both working and nonworking children and asked to indicate which children (s)he would attend to and which (s)he would ignore (3). At this point in the program, we explain to the trainee that in ignoring such inappropriate or ambiguous behaviors as daydreaming, etc., we are not asking them to punish these behaviors but rather to attend to those behaviors which appear to be more directly related to the acquisition of academic skills.

In the next step of the program, the trainee makes reinforcing statements for each of the self-management slides shown (4). The next two steps, deciding the order in which children in a group should be attended (5), and learning the pattern of the first level of interactions (that is, approaching and reinforcing self-management behaviors in a child) (6), prepare the trainee to go into the classroom and coordinate all of these elements. These steps also use slides but there are no rigid rules for correct answers. The objective is rather to introduce the trainee to some of the more obvious problems and propose possible solutions before going into the room.

The last step of the first section is an in-class video taping of the trainee (7). This is a 10-15 minute tape, coded by the trainee and the trainer by checking on a form the number of reinforcing statements made and for which behaviors (see the Appendix for an example of forms and coding). This checklist keeps the trainee's attention on that part of the performance for which we are training rather than other, less alter-

able aspects: personal appearance, sound of voice, etc.[2] If the trainee has not met criteria for reinforcing different self-management skills frequently enough, (because reinforcing a behavior depends on the behavior being exhibited, no specific criteria are set), (s)he is asked to be retaped.

Figure 5 shows the second section of the training. It involves training in identification and reinforcement of various aspects of task performance. Since this section is much more loosely structured, there are no arrows joining the boxes. Steps 10 and 12 can often be done immediately without performing the prior steps. Step 13 refers to the process by which a teacher may notice self-management skills but choose to reinforce the more complex curricular skills (or reinforce both types). Step 14, drawing a pattern of travel on the floor plan, can be done earlier in the program by the trainee. It is included here primarily to focus the trainee's attention on the constraints and support that the physical plan of a room may exert on the ability and frequency of contacting children.

The final video tape (step 15) is then analyzed by both the trainee and the trainer using two forms, one concerned with self-management skills, and the other with self-instructional and academic skills. The trainee is expected to make approximately 20 contacts in a ten-minute session and get to all of the working children at least once during the tape.

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[2]The micro teaching model generally uses small numbers of children for short durations of time for purposes of teacher training. However, we felt that the major difficulty most teachers encountered was moving away from the small group tutorial model of instruction to the individualized model. We were worried that if small groups were used at first, this would generate inappropriate strategies (such as sitting or standing and waiting for a child to complete a portion of work) which would then have to be unlearned.

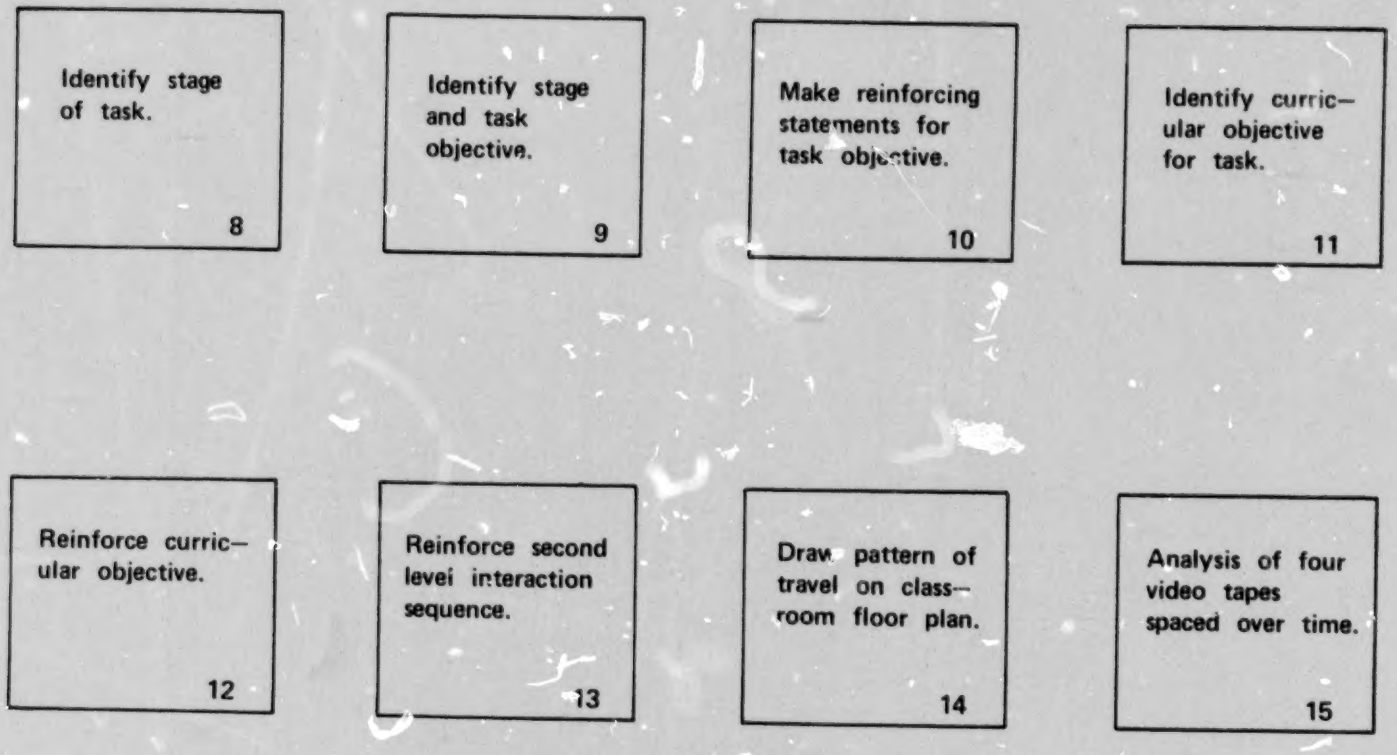

Figure 5. Sequence of Training Program: Section 2

Program Tryout and Evaluation

The evaluation of any training effort should concern itself with three general points. First, does the program train what it is supposed to train? Second, are the skills being trained for the most efficient means (in terms of time) possible? Third, are the skills concerned the appropriate ones? The evaluation presented here will concern itself primarily with aspects of the success in training (the second point) and suggest directions for further research on the other points. The program was developed and tried out in the field as opposed to the laboratory. This field experience has the advantage of showing the program's viability in such a setting; it has the disadvantage of not permitting discussion along lines of classical experimental design.

Program Trials. The first trial of the program was conducted in the summer of 1970 in a workshop for two preschool teachers, three kindergarten teachers, and five aides in a school which used the PEP-IPI program. The population of this school, located in an urban area, is comprised predominately of low-income black children. Because of time shortage and the lack of an operating classroom, the program was presented only in part (steps 1-4 and 8-12, the nondiscussion sections for which no classroom was needed, on Figures 4 and 5). The program was presented over a two-week period for a total of 15 hours of training.

The plan was to pre- and posttest each objective in each section. The teachers, however, quickly began to object to the pretesting due to their high failure rate. All but the major sectional pretests, therefore, were dropped. This is a relevant point to note: it appears, on the one hand, that pretests are punishing if the skill is totally unknown, and on the other hand, that programmed instruction perhaps makes too frequent use of them. (The main reason for failure was the inability of the trainees

to describe in any way the actions of the children in the slides.) The posttests were not objected to and were kept.

The data in Table 2 represent the average pretest and posttest scores for sections 1 and 2 for ten subjects. In each section these data are based on the combined scores of three pretests and four posttests. (The scores are combined for two reasons. First, the pretests were sometimes incomplete for any one section--because of the dislike some teachers had for them. Second, it is easier to see the results from two sets of numbers than seven. No significance tests are presented because of the small number of subjects and the inappropriate nature of variance and skewness in these criterion-referenced tests.) These tests are comprised of samples of behaviors from the sections being trained for. The tests consisted of slides of children matched as closely as possible for content without being duplicates. The slides for section 1 showed students engaged in a variety of self-management skills. The slides for section 2 showed tasks in various stages of completion and with varying degrees of correctness. The tests consisted of writing responses to questions about the slides. These responses were then scored according to a key. (For a more detailed description and forms, see Reynolds & Leinhardt, 1970.)

While most trainees did not master the pretests, all mastered the posttests at the criterion of 90 percent correct. The large standard deviations in pretest scores can probably be explained by the fact that we were training four new and six experienced teachers and aides. Three of the five teachers had helped to conduct classroom experiments and were familiar with the categories of behavior in which we were interested. The more consistent posttest scores reflect the effectiveness of the program in bringing all teachers to criterion level.

Table 2
First Trial

Average Percentage Correct for Ten Subjects
on Pre- and Posttests for Section 1

	$\bar{X}$	S.D.
Pretest 1	63.00	21.95
Posttest 1	94.00	2.80

Average Percentage Correct for Ten Subjects
on Pre- and Posttests for Section 2

	$\bar{X}$	S.D.
Pretest 2	59.00	12.96
Posttest 2	93.00	7.09

The next trial of the program was conducted in the winter of 1970-71. It was tried with four student teachers and two regular teachers. The four student teachers were practice teaching at one school and the teachers were from another school similar to the first. The entire program was run over a period of one and one-half months for a total of ten hours of instruction (we lost two student teachers during the second section due to illness). To economize on administration time and trainee effort without increasing the errors made during training, each section had a single pre- and posttest. Pre- and posttest data are presented in Table 3; they repeat the findings of the first trial. In addition to the pre- and posttests, we were able to take three video tapes of each trainee: a pretape before training, a tape at the end of the first section, and a tape at the end of the training program, the initial pretape served as a baseline for both sections 1 and 2.

In order to have comparable tapes without interruption, the first ten minutes of actual traveling (after the majority of children have obtained their assignments and the teacher has started traveling) on each tape were analyzed on the basis of four criteria: (1) frequency of contacts, the total number of separate contacts of any kind which were made; (2) total number of self-management skills reinforced, counted only when the trainee made a specific statement identifying the skill; (3) total number of unique self-management skills reinforced; (4) total number of task performance skills reinforced (this includes self-instructional, academic, and curriculum statements). The coding for the last criterion is complex: if any of the three task performance skills are reinforced <u>alone</u> they are counted as a single contact; however, if a self-instructional and academic contact are made together, they are counted as <u>one</u> contact; identifying the curricular objective is always counted separately. This system of coding was adopted to avoid inflating the task performance category.

Table 3
Second Trial

Average Scores for Six Subjects on Pre- and Posttests for Section 1

	$\bar{X}$	S.D.
Pretest 1	66.00	10.45
Posttest 1	94.16	4.48

Average Scores for Six Subjects on Pre- and Posttests for Section 2

	$\bar{X}$	S.D.
Pretest 2	57.66	16.40
Postest 2	90.00	5.00

The frequency of contacts can contain both a self-management and a task performance contact. Therefore, the sum of criterion 2 (self-management contacts) and criterion 4 (task performance contacts) can exceed the number recorded for criterion 1. For example, a single statement which identified a self-management skill, a self-instructional skill, and an academic skill would be coded as one contact (criterion 1), one self-management contact (criterion 2), and one task performance contact (criterion 4). For an example of the coding sheets used and sample codings, see the Appendix.

Table 4 shows the following averages over the six subjects: the number of total contacts made, the number of self-management skills reinforced, the number of unique self-management skills reinforced, the number of total task performance contacts, and the percentage of specific verbal identification of the behavior(s) being reinforced divided by the number of total contacts made. This indicates to what extent the statements made were specific in terms of our criteria and to what extent other kinds of statements, negative, group instructions, and non-specific positive contacts were made.

The total frequency of contacts (column 1), coded with 92 percent inter-observer agreement between two observers (agreement with a straight percentage agreement), shows an increase in the number of contacts from the pretape to the tape at the end of the first section. This is expected because we were asking teachers to reinforce behaviors which they had previously ignored. The final tape shows a drop in the number of contacts from the second tape, but an increase over the first tape. Because the second section of the program teaches academic and self-instructional skills, which are more time-consuming than the reinforcement of self-management skills, one would expect fewer contacts to be made.

Table 4

Average Results for Six Subjects on Three Tapes

	1 Frequency of Contacts		2 Frequency of Self-Management Skill Contacts		3 Number of Different Self-Management Skills		4 Frequency of Task Performance Contacts (Sum of Academic, Self-Instruction and Curriculum Contacts)		5 Percentage of Total Contacts Which Were Specific	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Pretape	24.5	9.00	5.5	4.1	2.0	1.7	12.50	6.1	65.00	19.00
Section 1	39.5	11.33	18.5	5.3	4.5	1.6	20.25	5.0	82.25	5.26
Section 2	34.5	9.22	10.0	2.5	3.5	1.6	34.25	6.9	93.25	4.14

Continuing with Table 4, the total number of self-management skills reinforced (column 2), coded with 90 percent inter-observer reliability, shows a pattern identical to the straight frequency count although with a more obvious increase from the first tape to the second. The total number of unique self-management skills reinforced (column 3), however, does not show a similar improvement. There are several possible explanations. First, in a classroom that is already operating (i.e., mid-year) self-management skills may already be fairly well established and do not need extensive reinforcement. In this context, self-management skills can be reinforced infrequently and still be maintained, provided consequences such as completing an academic task for exhibiting self-management skills are also reinforced. Second, a common practice of some teaches is to frequently reinforce all of the self-management skills involved in getting the first box or task of the day, and then not to reinforce those skills again. Because coding of the tapes is not started until after all of the tickets have been obtained or passed out and most of the children have started to work, initial reinforcing statements are excluded. Another possible explanation is that kindergarten and first grade pupils need less reinforcement to maintain their behaviors than do preschool children. This is supported by the data. The average number of <u>different</u> skills reinforced by preschool teachers after training is six, but only three for teachers in higher grades. However, it is clear that the program is not as successful as it might be in developing diversity in the types of behaviors reinforced.

The total number of task performance contacts (column 4), coded with 85 percent inter-observer reliability, is interesting because of the transfer implications in the data. The trainees all showed an increase in academic contacts from the first to the second tape, that is, prior to being trained in that area. This seems to indicate that merely specifying

the objectives in one area helped the trainee to make more specific statements in another area. The last tape continues the trend of increases; this is expected because the last section of the program emphasizes these skills.

The last column of the table (percentage of specific contacts made) is derived from the previous data obtained from the video tapes. It is coded with 89 percent inter-observer reliability. All of the comments in a given contact (as defined above) were treated as a single case. If any contact was specific (i.e., if it identified the behavior or concept being reinforced), the entire contact was counted as "specific." The figures represent specific contacts divided by the sum of specific plus nonspecific contacts. Therefore, the denominator is always the number in column 1, but the numerator is generally smaller than the sum of columns 2 and 4. (For an example of the coding, see the Appendix.) The steady increase in the percentage of specific comments made indicates that certain types of contacts (e.g., negative and vague statements) were gradually eliminated by developing more positive and specific verbal behaviors rather than by specifically criticizing such statements during training.

Conclusions and Implications

To summarize the findings of the program, we have shown that some teachers can be trained to make more specific and, hopefully, more informative verbal statements. We do not know if we are training them in the most efficient or most effective way possible. Studies to determine this could include redundancy checks by offering differentially shortened versions of the program to different trainees. However, in terms of obtaining subjects for this type of training situation, this technique is somewhat expensive.

An alternative to a strict programming procedure would be to attempt to convey the same information to teachers in a more informal and less structured way. For example, teachers could be given a partial list of self-management skills, given a model of what should be done in the classroom, and asked to attempt to reinforce the behaviors on their own. Video taping sessions could be arranged at various points at the teacher's request. Additional self-management and cognitive skills could be identified by the teachers, trainers, and curriculum developers rather than the trainers alone; alternatively, the use of video tapes alone could be investigated. There are advantages and disadvantages in each type of training procedure, but what needs to be investigated is the specific cost, transportability, and flexibility of several programs, each attempting to teach a similar set of behaviors to trainees. Further, such studies should include a close examination of children's performance under differentially trained teachers.

As adaptive systems of education provide for more options in the modes, rates, and goals of the education of a child, the responsibility for clearly specifying differing teacher roles and their implications also grows. Interestingly, it appears that while the specific analysis of any portion of a teacher's role needs to be very rigorously and carefully thought out, the training of a teacher to assume those new roles need not be so tightly structured. Of course, this is an empirical question, one which can be resolved by using different techniques to teach similar skills. Or, if it appears that there may be an interaction between skills and techniques, different techniques could be used to train different skills.

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APPENDIX

SAMPLING CODING SHEETS AND CODES

The following three sheets, as filled out by the teacher, would be coded as follows:

Frequency of contacts (Sheet 1)	= 25
Frequency of self-management skill contacts (Sheet 2)	= 11
Number of different self-management skills (Sheet 2)	= 2
Frequency of task performance contacts (Sheet 3)	= 16
Number of specific contacts (Sheets 2 and 3)	= 22*
Percentage of total contacts which were specific (Sheets 1, 2, and 3)	$= \frac{22}{25} = 88$

*
16 task performance contacts
+ 11 self-management contacts
- 5 overlapping contacts
22 specific contacts

Reinforcing Statements

Traveler _____
Trainer _____
Objective _____

Time in _____ Time out _____
Duration of evaluation _____
Evaluator _____

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
exclamation	X	X	X	X	X																									
Adjectives																														
1. good	X	X	X	X	X	X	X	X	X																					
2. great	X	X	X																											
3. fantastic	X																													
4.																														
5.																														
6.																														
7.																														
8.																														
9.																														
10.																														
11.																														
12.																														
13.																														
14.																														
15.																														
16.																														

total contacts made = 25 ||||| ||||| ||||| ||||| |||||

total contacts with definite praise = 18

Self-Management Traveling

Time in _____ Out _____ Trainer _____ Traveler _____

Evaluator _____ Number of Children _____ Objective _____

for a 10-minute period check off each reinforcement of a self-management skill

	1	2	3	4	5	6	7	8	9	10	11	12
Ticket	✓	✓	✓	✓	✓	✓						
Selects a task from ticket												
Goes to correct shelf												
Looks for task												
Takes task												
Looks for next task, if necessary												
Takes task to work space												
Raises hand	⊘	⊘	⊘	⊘	⊘							
Works on task												
Takes objects from box												
Returns objects to box												
Places complete written work in folder												
Returns task to correct shelf												

◯ means task performance skill was also identified

Academic Traveling

Traveler_____

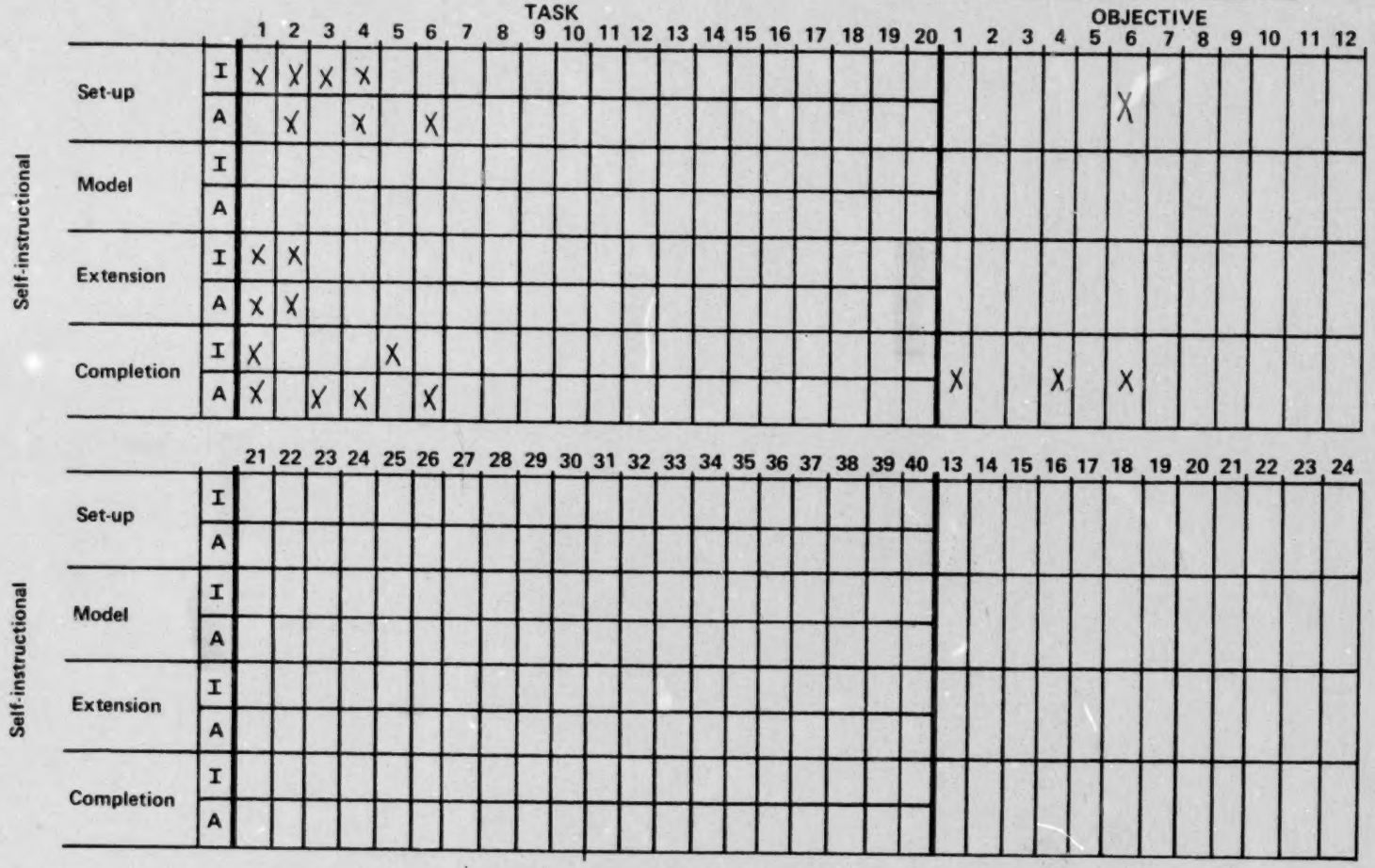
Trainer_____

Objective_____

Time in_____ Time out_____

Duration of evaluation_____

Evaluator_____



Total Academic Contacts 13 + Objectives Total Self-Instruction Contacts 3 Total Contacts 16

Duration of Traveling Recorded 10 MIN.

I = Self-instructional A = Academic